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REMARKS

Claims 1-23 and 30-51 are pending in the application. Claims 1, 10, 17, 30, 39, 43, 46, and 48 are amended herein. Claim 44 is canceled herein without prejudice. No new material is added by the amendments herein.

Allowable Subject Matter

Applicants thank Examiner Rachuba for indicating the allowable subject matter.

Claim Objections

Claims 43 and 44 are objected to because of informalities. Applicants herein amend claim 43 and cancel claim 44 to overcome these objections. Withdrawal of the objection to these claims is respectfully requested.

Rejections under 35 USC §102

Claims 1, 3-10, 12-15, 20-22, and 39-42 are rejected under 35 USC §102(e) as being anticipated by Yi et al., United States (US) Patent number 6,930,782 ("Yi"). The Examiner states that Yi discloses the claimed invention, including a reflectance image processing subsystem for acquiring one or more two-dimensional images of the substrate during CMP and deriving from the images information about the substrate useful for subsequent CMP of the substrate. The Examiner further states the subsystem of Yi includes a capturing device for capturing a plurality of one-dimensional reflectance images and deriving the one or more two-dimensional images from the one-dimensional images. The Examiner also states that Yi discloses light from the subsystem is transmitted through one or more optically transparent elements in the platen and/or polishing pad. The Examiner opines that Yi discloses that light is transmitted from the elements in the platen or pad by means of first and second optical fiber bundles that carry the reflected light to a wavelength-dispersive element for dissecting spatial components of the one-dimensional image into their respective wavelength components. The Examiner cites as support for her statements the following portions of Yi: figures 1 and 2; column 2, lines 3-13 and lines 23-36; column 3, line 52 through column 6, line 58; and figures 6 and 7 and their respective descriptions.

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Applicants respectfully submit that the claims are patentably distinct from Yi because Yi does not disclose a system comprising a reflectance image processing subsystem for acquiring one or more two-dimensional images of a substrate during CMP of the substrate, the images comprising an optical representation of at least a portion of the substrate. As described in detail below, Yi defines “images” to be simple x-y plots of data in which time is plotted on the x-axis and wavelength (nanometer) data is plotted on the y-axis. The definition of images as x-y data plots in Yi is in stark contrast to the images described in the claims of the present application as optical representations of one or more portions of the substrate. Thus, as the simple x-y data plots or “images” of Yi are not optical representations of one or more portions of the substrate, Applicants submit that Yi does not disclose the system claimed in the present application.

Applicants submit Yi describes a system for end point detection in semiconductor processing. The system described in Yi discloses dynamic in-situ capture of process related data. The Yi system uses captured and/or generated process related data to develop an image (Yi, column 3, lines 55-61). Yi describes a system in which components determine process related data in the form of broadband spectral data. The “spectral data” of Yi refers to “process related data indicative of the intensity of the reflected light energy during a determined time (t) in each of a determined number of wavelengths” (Yi, column 6, lines 4-11). Yi discloses that “spectral data and associated other process related data may be collectively referred to as a process snapshot” (Yi, column 6, lines 41-42).

Yi discloses that the system uses the process related data to develop an image that is a two-dimensional image representative of the process related data at a number of snapshots or determined times. The images described in Yi are therefore x-y plots of the wavelength of reflected light versus time (process related data). Yi, column 6, lines 51-58.

Yi shows examples in figures 3, 5, and 6 of two-dimensional images or plots developed based on spectral data. The two-dimensional images described in Yi are x-y data plots of wavelength (nanometer) data plotted versus time. More specifically, the images described in Yi, using figure 3 and the accompanying description (column 7, lines 13-25) for example, are limited to plots of data in which “a plurality of process snapshots

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302 may be represented by an image 300. The image 300 may include each of the process snapshots that were captured sequentially over a process time period represented along the x-axis of the image 300. The process time period may be the total of the time (t) from each of the process snapshots 302. The spectral data captured for each of the process snapshots 304 may be in a range of wavelengths (λ) 304 represented long the y-axis of the image."

Applicants respectfully submit that, with reference to claim 1, Yi does not disclose a system comprising a reflectance image processing subsystem for acquiring one or more two-dimensional images of a substrate during CMP of the substrate, the images comprising an optical representation of at least a portion of the substrate. As described above, Yi defines "images" to be x-y plots of data, where time is plotted on the x-axis and wavelength (nanometer) data is plotted on the y-axis. The description in Yi of images is in contrast to the images described in claim 1 (as amended) as optical representations of one or more portions of the substrate. Thus, as the x-y data plots of Yi are not optical representations of one or more portions of the substrate, Applicants submit that Yi does not disclose the system claimed in claim 1. Thus, applicants respectfully submit that claim 1 is patentable over Yi.

Additionally, as claims 2-9 depend from claim 1, claims 2-9 are patentable over Yi. Furthermore, as claims 10-23, 30-43, and 45-51 include limitations similar to those of claim 1, claims 10-23, 30-43, and 45-51 are also patentable over Yi. Accordingly, Applicants respectfully request withdrawal of the rejection under 35 USC §102.

Rejections under 35 USC §103

Claims 2, 11, 17-22, 30-38, and 43-51 are rejected under 35 USC §103(a) as being unpatentable over Yi in view of Bibby, Jr., et al., US Patent No. 6,361,646 ("Bibby"). Applicants respectfully submit that the claimed invention would not have been obvious to one of ordinary skill in the art in view of Yi and Bibby. Applicants respectfully submit that claims 2, 11, 17-22, 30-38, and 43-51 would not have been obvious in view of Yi for the reasons stated above. Furthermore, Applicants respectfully submit that claims 2, 11, 17-22, 30-38, and 43-51 would not have been obvious in view of Bibby because, like Yi described above, Bibby does not disclose a system comprising

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a reflectance image processing subsystem for acquiring one or more two-dimensional images of a substrate during CMP of the substrate, the images comprising an optical representation of at least a portion of the substrate. Thus, the combination of Yi and Bibby does not disclose a system comprising a reflectance image processing subsystem for acquiring one or more two-dimensional images of a substrate during CMP of the substrate, the images comprising an optical representation of at least a portion of the substrate. Therefore, Applicants respectfully submit that claims 2, 11, 17-22, 30-38, and 43-51 would not have been obvious in view of the cited references.

Conclusion

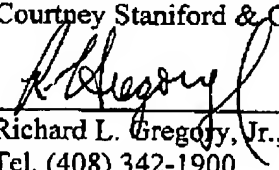
In view of the foregoing amendments and remarks, Applicants respectfully submit that the rejections under 35 U.S.C. §102 and §103 have been overcome, and their withdrawal is respectfully requested. Applicants submit that claims 1-23, 30-43, and 45-51 are in condition for allowance. The allowance of the claims is earnestly requested. If in the opinion of Examiner Rachuba a telephone conference would expedite the prosecution of the subject application, or if there are any issues that remain to be resolved prior to allowance of the claims, Examiner Rachuba is encouraged to call Rick Gregory at (408) 342-1900.

Authorization to Charge Deposit Account

Please charge deposit account 503616 for any fees due and not paid herewith in connection with this Office Action response.

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Respectfully submitted,
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